APPENDIX C - GLOSSARY

Purpose: This glossary establishes uniform definitions of terms, acronyms and abbreviations pertaining to digital evidence, audio and video analysis.

DEFINITIONS:

ADC: Analog to digital converter. Any extra circuitry designed to convert analog signals into digital data. They can be fitted inside a computer to convert analog video data into digital data. There are two basic types: a frame grabber, capable of isolating signals of video frames, or video grabbers, for digitizing video sequences. CCD sensors provide analog data which needs to be digitized through an ADC.

ADDITIVE/PRIMARY COLOR: Red, green and blue are the three colors used to create all other colors when direct or transmitted light is used (such as a computer monitor). They are called additive primaries because when pure red, green and blue are superimposed on one another, they create white.

ADMINISTRATIVE REVIEW: A procedure used to check casework for consistency with agency/laboratory policy and for editorial practice.

ALGORITHM: A set of rules (program) by which a computer solves problems.

ALPHANUMERIC: Both numbers and letters.

ANALOG: A signal that simulates sound or vision by electrical analogy, e.g. variations in voltage producing corresponding variations in brightness, or vice versa.

ANTI-ALIASING: A filter technique to smooth jagged edges on raster image screen computer graphics.

APPLE QUICKTIME MOVIE FORMAT: (MOV file format). Apple file format for storing and displaying compressed video sequences.

ARCHIVE COPY: A copy of data placed on media suitable for long-term storage from which subsequent working copies can be produced.

ARCHIVING: The process of storing data in a manner suitable for long-term storage and retrieval of a file.

ARTIFACT: A visual/aural aberration in an image, video or audio recording resulting from a technical or operational limitation.

ASPECT RATIO: The relationship between the height and width of a displayed image.

AUDIO CLARIFICATION: The processing of recordings for the purpose of increased intelligibility, attenuation of noise, improvements of understanding the recorded material and/or improvement of quality or ease of hearing.

AUTHENTICATION: The process of substantiating that the data is an accurate representation of what it purports to be.

AVI: (Audio/Video Interlaced). Microsoft file format for storing and displaying compressed video sequences.

BAUD RATE: A measurement of the speed at which information is transmitted by a modem over a telephone line. Baud Rates are in terms of bits per second (bps). Typical speeds are 2400, 9600, 36600 baud or higher. Strictly speaking, at speeds over 1200bps, the terms ‘baud’ and ‘bits per second’ are not completely interchangeable.

BINARY: Numbering system using two digits, 0 and 1. In imaging terms black and white.

BIOS: Basic input output system. A number of machine code routines that are stored in ROM and available for execution at boot time.

BIT: Short for binary digit – a single number having the value of either zero or one. Eight bits equal one byte.

BITMAP: 1. a binary representation of an image in which each bit is mapped to a point will either be on (black) or off (white). 2. An image formed by a rectangular grid of pixels, each one of which is assigned an address (X,Y coordinates) and a value, either grayscale or color.

BIT-MAPPED GRAPHIC: A graphic image formed by a pattern of pixels (screen dots) and limited in resolution to the maximum screen resolution of the device being used. Paint programs usually produce bit-mapped graphics.

BITMAP-TYPE IMAGE: A single-channel image with 1-bit of color information per pixel, also known as a bitmapped image. The only colors displayed in a bitmapped type image are back and white.

BITS PER PIXEL: (bit depth). The number of bits used to represent the color value of each pixel in a digitized image. One bit per pixel displays 2 colors, 2 bits 4 colors, 3 bits 8 colors, etc. Twenty-four bit displays show 16.7 million colors.

BLOOMING: A problem with older CCD's that causes pixel level distortions when the electrical charge created exceeds the pixel storage capacity, and spills into adjacent pixels. Newer CCD's incorporate anti-blooming circuitry to drain the excess charge.

BRIGHTNESS: One of three dimensions of color; the other two are hue and saturation. The term used to describe differences in the intensity of light reflected from or transmitted through an image independent of its hue and saturation.

BRIGHTNESS RANGE: May refer to the range of brightness within a subject being imaged, or the range of brightness capable of being captured by an imaging system.

BUFFER: Temporary electronic storage space for computer memory often used to hold graphic or text information.

BUG: A programming error that can cause unexpected results.

BUS: Path for transmitting data, expressed as an x-bit bus, e.g. 16-bit bus. The larger the bus, the faster the data is transferred.

BYTE: The standard unit of binary data storage in memory of disc files: a byte containing eight bits can have any value between zero and 255.

CAPTURE: The process of recording data such as an image, video sequence, or audio stream.

CAPTURE DEVICE: A device used in the recording of data.

CCD: Charge coupled device. A solid state imaging device containing numerous light sensitive picture elements (pixels) that produces an electrical output analogous to the amount of light striking each of the elements.

CD-R: A recordable (only once) compact disc.

CD-Rom: A form of CD used for storing digital data of all types (e.g. Kodak Photo CD). They are capable of storing 670 megabytes, but cannot be updated or changed by the user.

CHANNEL: Analogous to a plate in the printing process, a channel is the foundation of an image. Some image types have only one channel, while other types have several channels. An image can have up to 16 channels.

CLIPPING: Loss of shadow or highlight detail due to the conversion of gray tones lighter than a certain value to white, or darker than a certain value to black.

CLUSTERS: A group of sectors in a logical volume that is used to store files and folders

CMYK: Cyan, magenta, yellow, and black. The four colors used by printers to produce printed color illustrations.

CMYK IMAGE: A four-channel image containing a cyan, magenta, yellow and black channel.

COGNITIVE IMAGE ANALYSIS: The process used to extract visual information from an image.

COLORIMETRY: The quantification of the color of an object.

COLOR SEPARATION: The division of an image into component colors for printing.

COLORCYNC: A color management system from Apple.

COMPONENT VIDEO SIGNAL: An analog signal that represents a part of the composite signal. In a component signal these elements include Y (luminance), R-Y and B-Y (the color difference signals), or the red, green and blue signals separately. The R, G, B, color signals are sent through three separate coaxial cables.

COMPOSITE VIDEO SIGNAL: An analog signal which contains chroma, video, blanking and sync information and has been combined using one for the coding standards NTSC, PAL, SECAM, etc. This signal is sent through one coaxial cable.

COMPRESSION: A digital process that allows data to be stored or transmitted using less than the normal number of bits. Video compression refers to techniques that reduce the number of bits required to store or transmit images. Compression can be lossless, lossy or visually lossless.

COMPRESSION RATIO: The size of an image file before compression, divided by the file size after compression.

COMPUTER FORENSICS: A subdiscipline of Digital & Multimedia Evidence, which involves the scientific examination, analysis and/or evaluation of digital evidence in legal matters.

CONTRAST: The tonal gradation between highlights, midtones and shadows in an image.

CROP: To select part of an image and discard the unselected areas.

CRT: Cathode ray tube. The device which forms the basis of television and computer monitor displays.

CURVE: A graphical representation of the contrast and color of an image. Most image processing programs offer the capability of modifying the image using the 'curves' control. Sometimes referred to as 'gamma curve'.

CYLINDER: The set of tracks on the drive platters that are at the same head position.

DECOMPRESSION: Process used to change compressed files back into their original form.

DEINTERLACING: Any technique that converts interlaced scanned video into progressively scanned video. This process requires interpolation or replication to replace missing image lines in individual frames.

DENSITY: The ability of an object to stop or absorb light. The less light is reflected or transmitted by an object, the higher the density. Also, in electronic imaging, the number of characters that can be stored in a given physical area. As density increases, data storage increases.

DIGITAL: Information or graphical data that has been translated into discrete numerical values and therefore can be manipulated and reproduced without loss of quality.

DIGITAL EVIDENCE: Information of probative value that is stored or transmitted in binary form.

DIGITAL IMAGE: An image that is represented by discrete numerical values organized in a two-dimensional array. When viewed on a monitor or paper, it appears like a photograph.

DIGITAL IMAGE FILE: A record that includes image data and related data objects.

DIGITAL PHOTOGRAPHY: Producing or reproducing an electronic image represented by a series of numbers which can be manipulated by computer and then reconstructed as a photographic image.

DIGITIZE: Convert into digital form. Digitization is subdivided into the processes of sampling the analog signal at a moment in time and coding the number in binary form. A digital image is made up of a grid of points. There is no continuous variation of color or brightness. Each point on the grid has a specific value. Digital images are recorded as data, not as a signal.

DIRECTORY: The computer's filing system.

DISCOVERY: The criminal defendant's right to confront and challenge the evidence.

DOTS PER INCH: (dpi). A measure of the resolution of a scanner or printer.

DOWNLOADING: The reception and storage of a program or data file from separate digital media through data communication links.

DIRECTORY LISTING: A list of files contained within an object. It may also contain other information such as the size and dates of files.

DUPLICATE: An accurate and complete reproduction of all data objects independent of the physical media.

DYNAMIC RANGE: A measurement of the range of light levels recorded by a CCD or other sensor.

ERASED FILE RECOVERY: The process of recovering deleted files.

EXPORT: To output data in a form that another program can read.

FIELD: An element of a video signal containing alternate horizontal lines. For interlaced video, the scanning pattern is divided into two sets of alternating horizontal lines (odd and even) that are displayed sequentially. Each set of lines is called a field and the interlaced set of the two sets of lines is a frame.

FILE FORMAT: The overall format in which an image is saved. Choosing the correct format for saving images is important to ensure that the files are compatible with various software packages and other computer platforms. Examples are TIFF, EPS, PICT, and BMP.

FILE SLACK: The space between the logical end and the physical end of a file.

FILTER: A software routine which modifies an image by changing the values of certain pixels. Examples are sharpening filters and distortion filters.

FIREWIRE: A system for connecting peripherals such as digital cameras and scanners to computers. It uses a single, thin cable to carry data at speeds of up to 25 Mb per second.

FLATBED SCANNER: A scanner for both reflective and transparency materials that uses a linear array CCD.

FLOPPY DISC (OR DISKETTE): The name given to a 3.5 inch disc used for storing relatively small amounts of computer data. It consists of a magnetically sensitive flexible disc enclosed in a plastic envelope or case. There are two capacities available: double density (storing approximately 700Kb) and high density (storing approximately 1.4 Mb).

FORENSIC: The use or application of scientific knowledge to a point of law, especially as it applies to the investigation of crime.

FORENSIC AUDIO: A subdiscipline of Digital & Multimedia Evidence, which involves the scientific examination, analysis, comparison and/or evaluation of audio.

FORMAT: One or several combined elements that may be used to describe the video recording method. These include tape width (e.g. 8mm, ½ inch, ¾ inch,1 inch), signal form (e.g. composite, Y/C, component), media (e.g. VHS tape, DVD, CD), data storage type (e.g. analog/digital, AVI/MPEG), and signal standard (e.g. NTSC, PAL, SECAM).

FRAME: Lines of spatial information of a video signal. For interlaced video, a frame consists of two fields, one of odd lines and one of even lines, displayed in sequence. For progressive scan (non-interlaced) video, the frame is written through successive lines that start at the top left of the picture and finish at the bottom right.

FRAME-GRABBER: Hardware that takes the analog signal from an imaging device and digitizes the signal.

FREE SPACE: Data storage areas available for use by the computer. The area may already contain previously stored information. Also referred to as 'unallocated space'.

FORMAT CONVERSION: To transfer audio and/or video information from one media type to another and/or from one recording method to another.

HASH or HASH VALUE: Numerical values generated by hashing functions, which are used to substantiate the integrity of digital evidence and/or for inclusion/exclusion comparison against known value sets.

GAMMA: 1. the relationship between input data from an electronic image and output data telling the monitor how to display and image. 2. A measure of contrast that affects the mid-level grays (mid-tones) of an image.

GAMMA CORRECTION: Compressing or expanding the ranges of dark or light shades in an image.

GIF: (Graphical Interchange Format). A lossless compression file format commonly used for graphics images. It defines a protocol for the on-line transmission and interchange of raster graphic data. GIF uses LZW compression but is limited to 256 colors. It is independent of the platform used either in the creation of the file or the display.

GIGABYTE: A unit of measure of stored data corresponding to one billion bytes of information.

GRAY SCALE IMAGE: A single-channel image consisting of up to 256 levels of gray, with 8 bits of color information per pixel. Since each dot making up a pixel can be adjusted by the eight bits of information, this works out to a math formula of two to the power of eight of 256.

HALFTONE: An image created with a pattern of data of different sizes used to simulate a continuous-tone photograph, either in color or black and white. The halftone screen converts continuous-tone copy to line copies (discrete dots of varying sizes and shapes) for printing on a press.

HARD DISC: The term used either for an internal or external rigid disc used for reading and writing computer data. Many different capacities are available, including several types which are encased in plastic and can be removed from the drive mechanism (e.g. Zip, Jaz, and Syquest).

HARDWARE: The electronic components, boards, peripherals and equipment that make up your computer system. It is distinguished from programs (software) which tell the components what to do.

HEAD: A device that rides very close to the surface of the platter and allows information to be read from and written to the platter.

HIGH DENSITY: A storage technique for secondary storage media as floppy discs. This technique requires the use of extremely fine-grained magnetic particles. High-density discs are more expensive to manufacture than double density discs. High-density discs, however, can store one megabyte or more of information on one 5 ¼ in or 3 ½ inch disc.

HISTOGRAM: A graphical representation of an image showing the distribution of gray or color levels within an image.

HOT SWAPPABLE: A drive that has the ability to be removed or replaced in a machine while the machine remains operating and without rebooting.

HUE: The main attribute of a color that distinguishes it from other colors.

ICON: In a graphical user interface, an on-screen symbol that represents a program file, data or some other computer entity or function.

IMAGE: An imitation or representation of a person or thing, drawn, painted, photographed, etc.

ARCHIVE IMAGE: Either the primary or original image stored on media suitable for long-term storage.

COPY IMAGE: A reproduction of information contained in a primary or original image.

DIGITAL IMAGE: An image that is stored in numerical form.

DUPLICATE IMAGE: An accurate and complete replica of an original image, irrespective of media.

ORIGINAL IMAGE: An accurate and complete replica of the primary image, irrespective of media. For film and analog video, the primary image is the original image.

PRIMARY IMAGE: Refers to the first instance in which an image is recorded onto any media that is a separate, identifiable object or objects. Examples include a digital image recorded on a flash card or a digital image downloaded from the Internet.

PROCESSED IMAGE: An output image (see Imaging Processing).

WORKING IMAGE: Any image subjected to processing.

IMAGE DRIVE: Same as a target drive.

IMAGE ANALYSIS: The extraction of quantitative information from an image beyond which is readily apparent through visual examination.

IMAGE AUTHENTICATION: Verifies that the original image has not been altered.

IMAGE AVERAGING: The process of averaging together similar images, such as sequential video frames, to reduce noise in stationary scenes.

IMAGE COMPARISON: The process of comparing images of questioned objects or persons to known objects or persons or images thereof, and making an assessment of the correspondence between features in these images for rendering an opinion regarding identification or elimination.

IMAGE COMPRESSION: The process of reducing the size of a data file.

IMAGE ENHANCEMENT: Any process intended to improve the visual appearance of an image.

IMAGE PROCESSING: Any activity that transforms an input image. Techniques that transform pixel values of an image for some particular purpose, e.g. brightness or contrast correction, changing the size (scaling) or shape of images, or enhancing detail. Note: image processing does not mean that the input image is overwritten during the process. Forensic image processing should only be performed on working images.

IMAGE PROCESSING LOG: A record of the steps used in the processing of an image.

IMAGE RESTORATION: Any process applied to an image that has been degraded by a known cause (such as defocus or motion blur) so the effects of that degradation are partially or totally removed.

IMAGE SYNTHESIS: Any process that renders an image through the use of computer graphics techniques for illustrative purposes (e.g. age progression, facial reconstruction, accident/crime scene reconstruction).

IMAGE TECHNOLOGIES: Any system and/or methods used to capture, store, process, analyze, transmit, or produce an image. Such systems include, but are not limited to, film, electronic sensors, cameras, video devices, scanners, printers and computers.

IMAGE TRANSMISSION: The act of moving images from one location to another.

IMAGE VERIFICATION: A process by which an individual identifies an image as being an accurate representation.

IMPORT: To load a file created by one program into a different program.

INTERFACE: An electronic circuit that governs the connection between two hardware devices and helps them exchange data reliably.

INTERMEDIATE STORAGE: Any media or device on which an image is temporarily stored for transfer to permanent or archival storage.

INTERPOLATION: A process by which the apparent resolution of an image is increased. In most cases, the software mathematically averages adjacent pixel densities and places a pixel of that density in between.

INTERLACED SCAN: Video in which each field frame does not contain information from every horizontal scan line of the imaging sensor. This is commonly performed by storing video sequentially as field frame A, field frame B, field frame A, field frame B…, in which field frame A contains only even-numbered horizontal scan lines, and field frame B contains only odd-numbered scan lines.

ITU 601: An international standard for component digital television. ITU 601 defines the sampling systems, matrix values and filters characteristics for Y, Cr, Cb and RGB component digital television. It establishes a 4:2:2 sampling scheme at 13.5 MHz for the luminance channel and 6.75MHz for the chrominance channels with eight-bit digitizing for each channel, providing a total signal bandwidth of 168mbs. The term 4:2:2 refers to the ratio of the number of luminance

channel samples to the number of chrominance channel samples. For every four luminance samples, the chrominance channels are each sampled twice.

IPADDRESS: Internet Protocol Address. An IP address is a 32-bit number that identifies either the sender or the receiver of information. This information is sent in packets across the network and each machine on the network has a unique IP address to identify it.

JPEG: (Joint Photographic Experts Group). A lossy image compression process. Users can set their own quality settings on a sliding scale within the application software.

LEGACIES FILE MANAGEMENT: A methodology for preserving data and images so that they are retrievable as technology changes.

LINES PER INCH: (lpi). The scale used by printers when specifying the halftones screen used in a printing process.

LOG FILE: A record of actions, events and related data.

LOGICAL DRIVE: A drive named by a DOS drive, specified such as C or D. A single physical drive can act as several logical drives, each with its own specifier.

LOSSLESS COMPRESSION: Compression in which no image data is lost and the image is retrieved in its original form.

LOSSY COMPRESSION: Compression in which image data is lost and cannot be retrieved in its original form.

LUMINANCE: Lightness; the highest of the individual RGB values plus the lowest of the individual RGB values, divided by two.

LZW: (Lempel-Ziv-Welch). A lossless compression process used by TIFF and GIFF file formats.

MD5 HASH: A 128 bit number that uniquely describes the contents of a file. This is the standard hash code utilized in Forensics.

METADATA: Data, frequently embedded within a file, that describes a file or directory which can include the locations where the content is stored, dates and times, application specific information, and permissions.

MERGE: To combine two or more groups of data into one larger arranged set of data, such as two pictures.

MIDTONE: Tonal value of dot, located about halfway between highlight value and the shadow value.

MPEG: (Motion Pictures Experts Group). Similar to JPEG. A standard compression algorithm used to compress video and audio sequences.

MULTIMEDIA EVIDENCE: Analog or digital media, including but not limited to, film, tape, magnetic and optical media and the information therein. This definition is meant to clarify the analog evidence such as videos received for the purpose of analysis, comparison and/or evaluation and is included within the Digital & Multimedia Evidence discipline.

MULTIPLEXER/DEMULTIPLEXER: A device used to combine multiple video signals into a single signal or separate a combined signal. These devices are frequently used in security and law enforcement applications for recording and/or displaying multiple camera images simultaneously or in succession.

NATIVE FILE FORMAT: The original form of a file. A file created with one application can often be read by another, but a file's native format remains the format it was given by the application that created it. In most cases the specific attributes of a file (for example, fonts in a document) can only be changed when it is opened with the program that created it.

NOISE: In an image, pixels with randomly distributed color values.

OPERATING SYSTEM: A master control program for a computer that functions and provides you with a means to control the computer's operations.

ORIGINAL IMAGE: An accurate and complete replica of the primary image, irrespective of media. For film and analog video, the primary image is the original image.

PAL: Phase Alternation Line. (European Broadcast Union).

PARALLEL PORT: Often referred to as the "Centronics port", this is most often used for connecting computers to printers. Parallel ports have eight parallel wires which sent 8 bits (1 byte) of information simultaneously, in the same amount of time which it takes the serial port to sent one.

PARTITION: User-defined section of electronic media.

PASSWORD RECOVERY: The process of locating and identifying a series of characters used to restrict access to data.

PERIPHERAL: A device, such as a printer or disc drive, connected to and controlled by a computer but external to the computer's central processing unit.

PHOTOGRAMMETRY: The science involving methods, techniques, and analytical procedures used to make accurate measurements of distance and/or size of object from photographic images.

PHOTOMETRY: The measurement of light values of objects in an image.

PIXEL: Picture element. The smallest area capable of resolving detail.

PHYSICAL COPY: An accurate reproduction of information contained on the physical device.

PHYSICAL IMAGE: A bit-stream duplicate of data contained on a physical device.

PIXEL INTERPOLATION: Techniques for increasing the size of a graphics file by creating pixels to produce pseudo-detail in an image.

PIXEL REPLICATION: Technique for increasing the size of a graphic file by duplicating existing pixels a set number of times.

PIXELLATION: Subjective impairment of the image in which the pixels are large enough to become visible individually.

PLAYBACK OPTIMIZATION: The process of determining the most suitable equipment and settings for analyzing the output signal.

PLAYBACK: Recorded material viewed and heard as recorded, facilitated by camcorder, cassette recorder, or other device.

PRIMARY IMAGE: Refers to the first instance in which an image is recorded onto any media that is a separate, identifiable object. Examples include a digital image recorded on a flash card or a digital image downloaded from the internet.

PLUG-INS: A piece of hardware or software that adds a specific feature or service to a larger system.

PRODUCTION SWITCHER: A device and/or software used to mix video and/or audio signals from two or more sources.

PROFICIENCY TESTING: A test to evaluate analyst, technical support personnel and the quality performance of an agency. (Four examples are provided: 1. Open test – The analyst(s) and technical support personnel are aware they are being tested. 2. Blind testing – The analyst(s) and technical support personnel are not aware they are being tested. 3. Internal test – Conducted by an internal agency itself. 4. External test – Conducted by an agency independent of the agency being tested.)

PROGRESSIVE SCAN: (Non-interlace). Video in which each image frame contains information from every horizontal scan line of the imaging sensor.

PROPERIETARY FILE FORMAT: Any file format that is unique to a specific manufacturer or product.

QUANTITATIVE IMAGE ANALYSIS: The process used to extract measurable data from an image.

RAM: Random access memory. Temporary working memory created when the computer is switched on. The size of images which can be opened depends on how much RAM is installed in the computer.

RASTER: A series of scanning lines which provides uniform coverage of an area. The number and length of the lines are related to resolution.

RECONSTRUCTION: The process of repairing damaged media in order to allow the retrieval of data.

RELIABILITY: The extent to which information can be depended upon.

REPLICATION: A form of image re-sampling where the exact colors of neighboring pixels are copied. This should only be used when doubling or quadrupling resolution, i.e. 200, 400, 800 percent, etc.

REPRODUCIBILITY: The extent to which the evidence had been preserved and safeguarded.

RESAMPLING: Changing the resolution of an image, either by discarding unwanted pixels, or interpolating new ones.

RE-SIZING: Changing the size of an image without altering the resolution. Increasing the size will lead to a decrease in image quality.

RESOLUTION: The ability of a recording system to record and reproduce fine detail. In digital imaging, the resolution of the final image depends upon the resolution of the image capture device, any change made during image processing by computer, and the resolution of the output device. The term image resolution refers to the number of pixels within an image and is measured in pixels per inch. An image recorded with a Kodak DCS 460 camera, for example, has 2048 x 3072 pixels or 6291456 pixels in total. Because the number of pixels within an image is fixed, increasing or decreasing the image size (resizing) will alter the resolution. Image processing programs like Photoshop have the ability to both resize and resample the image. When looking at the resolution of imaging devices, particularly scanners, it is important to distinguish between optical resolutions (i.e. the actual number of picture elements on the CCD) and higher resolutions created by the process of interpolation. A scanner may be advertised as having a resolution of 1200dpi, when in fact it has an optical resolution of 600dpi, interpolated to 1200dpi by scanning software.

Video resolution is given in lines per picture height, e.g. 625 lines. CRT resolutions are usually given as number of pixels per scan line, and the number of scan lines, e.g. 640x480 (NTSC), 768x512 (PAL). Printer resolutions are usually given as dots per inch, e.g. 300dpi.

RGB: Red, Green and Blue. The three primary colors use in monitor displays.

RGB IMAGE: A three channel image containing a red, green and blue channel. The additive primary colors.

RIFF: (Raster image file format). An image file format for grayscale images; it has the chief advantage of offering significant disc space savings by utilizing compression.

RIP: Raster image processor. A device which converts a page description language (PDL) such as Post Script into the raster form necessary for output by an image setter, film recorder or laser printer.

ROM: Read-only memory. A memory unit in which data is stored permanently. The information is read out non-destructively and no information can be written into memory.

SCANNER: A peripheral device that digitizes and stores the image as a file that can be merged with text in many word processing and page layout programs.

SCSI: Small Computer System Interface. An industry standard for connecting peripheral devices to computers.

SECTOR: A group of bytes within a track, and is the smallest group of bytes that can be addressed on a drive.

SECURITY: The extent to which the evidence has been preserved and safeguarded.

SERIAL PORT: A port that synchronizes and makes asynchronous communications between the computer and devices such as serial printers, modems and other computers easier.

SIGNAL-TO-NOISE RATIO: The relationship between the required electrical signal to the unwanted signals caused by interference (usually measured in decibels, dB).

SOFTWARE: System, utility or application program expressed in computer-readable language.

SOURCE CODE: The list of instructions written in a standard programming language used to construct a computer program.

STORAGE: The act of preserving an image or other data.

STORAGE DEVICE: Any optical or magnetic device capable of secondary storage functions in a computer system.

STORAGE MEDIA: Any object to which an image or data is preserved.

TARGET DRIVE: The drive that information from the suspect drive is being written to.

THUMBNAIL: A very low resolution version of an image used for sorting and finding images.

TIFF: (Tagged image file format). A standardized image file exchange format. It has been adopted by many manufacturers that support high resolution graphics.

TIME-BASE CORRECTOR: An electronic device used to correct timing inconsistencies and stabilize the playback of the video signal for optimum quality. It also synchronizes video sources allowing image mixing.

TIME-LAPSE VIDEO RECORDING: Process by which images are recorded at less than the standard rate of frames, thus extending the period of time that can be covered by the storage medium.

TIMELINE/SEQUENCE RECONSTRUCTION: The process of relating images, audio, or other data to one another in a chronologically ordered succession.

TRADITIONAL ENHANCEMENT TECHNIQUES: Techniques that have direct counterparts in traditional darkrooms. They include brightness & contrast adjustment, color balancing, cropping, and dodging & burning.

TWAIN: A cross-platform interface for acquiring images with scanners and frame-grabbers.

UNALLOCATED SPACE: Data storage areas available for use by the computer. The area may already contain previously stored information.

UNDO: A command that restores the program and data to the stage just prior to the last command.

UNSHARP MASKING (USM): A procedure for increasing the apparent detail of an image, performed either by the input device or by computer processing.

UPLOAD: To transmit a file by telecommunications to another computer.

VALIDATION TESTING: An evaluation to determine if a tool, technique or procedure functions correctly and as intended.

VECTORSCOPE: An electronic device that measures a video signal's chrominance performance.

VERIFICATION: 1. The process of confirming the accuracy of an item to its original. 2. Confirmation that a tool, technique or procedure performs as expected.

VGA: Video graphics array. An electronic display standard that defines a resolution of 640 x 480 pixels with a 16 color capability, and 320 x 200 pixel resolution with a 256 color capability from a potential palette of 256,000 colors.

VIDEO ANALYSIS: A subdiscipline of Digital & Multimedia Evidence, which involves the scientific examination, comparison, and/or evaluation of video in legal matters.

VIDEO ENHANCEMENT: Any process intended to improve the visual appearance of video sequences of specific features within video sequences.

VIRTUAL MEMORY: A technique for increasing the apparent size of memory available by using memory from the hard disc. It is generally very slow.

VIRUS: A computer program designed as a prank or as sabotage that replicates itself by attaching to other programs and carrying out unwanted or sometimes damaging operations.

WAVEFORM MONITOR: An electronic device that provides a graphical display of a video signal.

WORK COY: A copy or duplicate of a recording or data that can be used for subsequent processing and/or analysis.

WRITE BLOCK/WRITE PROTECT: Hardware and/or software methods of preventing modification of media content.

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